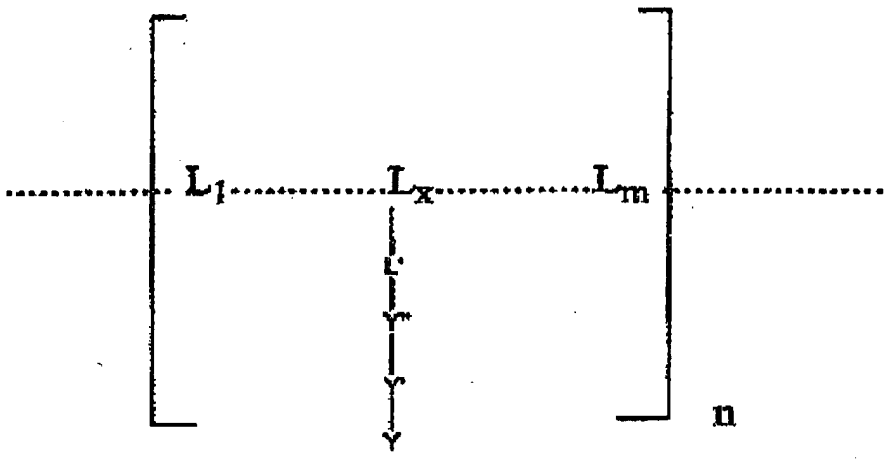
RECEIVED
CENTRAL FAX CENTER
MAY 1 1 2009

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A covalently reactive ligand analogue (CAL) of formula (1):



(1)

wherein, $L_1...L_x...L_m$ are components defining a ligand determinant,

L_x is a component unit of the ligand determinant ~~selected from the group consisting of an amino acid residue, sugar residue, a fatty acid residue and a nucleotide~~,

L' is a functional group of L_x,

Y" is atom, covalent bond or linker,

Y' is an optional charged or neutral group,

Y is a covalently reactive electrophilic group that reacts specifically with a receptor that binds to said ligand determinant,

n is an integer from 1 to 1000; and

m is an integer from 1 to 30.

Claim 2 (currently amended): [[A]] The CAL of claim 1, wherein L' is selected from a carboxyl group, an amino group, a hydroxyl group, a sulfhydryl group, a 4-hydroxy phenyl group, a phenyl group, an imidazole group, an indole group, a methylthioethyl group, a

guanidino group, a linear alkyl group, a branched alkyl group, a cyclic alkyl group, a linear alkenyl group, a branched alkenyl group, a cyclic alkenyl group, a linear alkynyl group, a branched alkynyl group, an cyclic alkynyl group, an aryl group, an amide group, an aldehyde group, a ketone group, a phosphate group, or a sulfate.

Claim 3 (currently amended): [[A]] The CAL of claim 1, wherein L' is a side chain functional group of ~~the following~~ an amino acid residue[[s:]] glycine, alanine, leucine, isoleucine, valine, methionine, cystein, aspartic acid, glutamic acid, asparagine, glutamine, lysine, arginine, phenylalanine, tyrosine, tryptophan, histidine, serine, threonine, or proline.

Claim 4 (currently amended): [[A]] The CAL of claim 1, wherein L' is the N terminal amino group or C terminal carboxyl group of a polypeptide.

Claim 5 (currently amended): [[A]] The CAL of claim 1, where L' is a functional group of a ligand containing unnatural components produced by chemical conjugation or genetic engineering.

Claims 6-9 (canceled).

Claim 10 (original): The CAL of claim 1 in which Y'' is a suberoyl group, a pimeroyl group, a succinyl group, an aminohexanoyl group, an aminoacetyl group, a poly(ethylene oxide)α,ω-dicarboxyl group or an acetylenedicarboxyl group

Claim 11 (original): The CAL of claim 1 in which Y' is a charged group selected from amino(4-amidinophenyl)methyl group, 2,6-diaminopentyl group, 1-amino-4-guanidinobutyl group, 1-amino-3-carboxylpropyl group and amino(4-carboxylphenyl)methyl group.

Claim 12 (original): The CAL of claim 1 in which Y' is a neutral group selected from amino(phenyl)methyl group, 1-amino-2-phenylethyl group, 1-amino-2-methylbutyl group, aminomethyl group, 2-aminoethyl group and 1-aminocyclohexyl group.

Claim 13 (original): The CAL of claim 1 in which Y is composed of an electrophilic atom Z attached to one or more substituents R.

Claim 14 (original): The CAL of claim 13 in which substituent R is an electron withdrawing group.

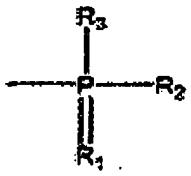
Claim 15 (original): The CAL of claim 14 in which R is selected from phenoxyl group, 4-nitrophenoxyl group, 4-cyanophenoxyl group, pentachlorophenoxyl group, 4-nitrophenyl group, 4-cyanophenyl group, cyanomethoxyl group, trifluoromethoxyl group and 4-nitrophenylmercaptyl group.

Claim 16 (original): The CAL of claim 13 in which R is an electron donating group.

Claim 17 (original): The CAL of claim 16 in which R is selected from 4-methoxyphenoxyl, 4-methylphenoxyl, methoxymethoxyl, 4-methoxyphenyl, 4-methylphenyl, methoxymethyl and 4-methoxyphenylmercaptyl.

Claim 18 (original): The CAL of claim 13 in which Z is a phosphorus, carbon, boron or vanadium atom.

Claim 19 (currently amended): The CAL of claim 18 in which Y has the formula (2):



(2)

in which Z is represented by a phosphorus atom,

R_1 is an oxygen or sulfur atom,

R_2 and R_3 are atoms or groups selected from hydrogen atom, oxygen atom, hydroxyl group, fluorine atom, chlorine atom, bromine atom, iodine atom, sulfur atom, sulfhydryl group, amino group, alkoxy group and phenoxy group~~, and~~

~~m is 4 to 22~~.

Claim 20 (original): The CAL of claim 13 in which R is a glyoxylpeptide or an aminoacylpeptide.

Claim 21 (currently amended): ~~A polypeptide~~ The CAL of claim 1 in which the ligand determinant . . . [L_1 . . . L_x . . . L_m] . . . is a polypeptide comprising a linear polyamino acid.

Claim 22 (currently amended): ~~A polypeptide~~ The CAL of claim 1 in which the ligand determinant . . . . [L_1 . . . L_x . . . L_m] . . . is a polypeptide comprising a non-linear polyamino acid.

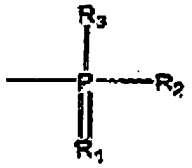
Claims 23-24 (canceled).

Claim 25 (currently amended): A method for activating or inactivating a nucleophilic receptor (NuR), comprising: contacting [[a]] the covalently reactive ligand analogue (CAL) of formula (1) of claim 1[[:]] ~~wherein, L.sub.1 . . . L.sub.x . . . L.sub.m are components defining a ligand determinant, L.sub.x is a component unit of the ligand determinant selected from the group consisting of an amino acid residue, sugar residue, a fatty acid residue and a nucleotide, L' is a functional group of L.sub.x, Y" is atom, covalent bond or linker, Y' is an optional charged or neutral group Y is a covalently reactive electrophilic group that reacts specifically with a receptor that binds to said ligand determinant, and n is an integer from 1 to 1000 m is an integer from 1 to 30;~~ with a nucleophilic receptor that reacts specifically with the ligand determinant of said CAL.

Claim 26 (currently amended): The method of claim 25, wherein wherein L' is ~~selected from~~ a carboxyl group, an amino group, a hydroxyl group, a sulfhydryl group, a 4-hydroxy phenyl group, a phenyl group, an imidazole group, an indole group, a methylthioethyl group, a guanidino group, a linear alkyl group, a branched alkyl group, a cyclic alkyl group, a linear alkenyl group, a branched alkenyl group, a cyclic alkenyl group, a linear alkynyl group, a branched alkynyl group, an cyclic alkynyl group, an aryl group, an amide group, an aldehyde group, a ketone group, a phosphate group, a sulfate group, or a side chain functional group of ~~the following~~ amino acid residues[[:]] glycine, alanine, leucine, isoleucine, valine, methionine, cystein, aspartic acid, glutamic acid, asparagine, glutamine, lysine, arginine, phenylalanine, tyrosine, tryptophan, histidine, serine, threonine, or proline,

Y" is a suberoyl group,

Y' is an amino(4-amidinophenyl)methyl group or an amino(phenyl)methyl group, Y has the formula (2):



(2)

R_1 is an oxygen or sulfur atom, and

R_2 and R_3 are selected from alkoxy group and phenoxy group~~, and m is 4 to 22~~.

Claim 27 (original): The method of claim 25, wherein the CAL is VIP-CAL, Factor VIII-CAL, β-amyloid peptide-CAL, CD4-CAL, EGFR-CAL or gp120-CAL; or the ligand is gp120, gp160, Lex1 repressor, gag, pol, hepatitis B surface antigen, bacterial exotoxins (diptheria toxin, C. tetani toxin, C. botulinum toxin, pertussis toxin.

Claim 28 (currently amended): [[A]] The method of claim 25, wherein the ~~for activating or inactivating a~~ nucleophilic receptor (NuR) that reacts specifically with the ligand determinant of said CAL is produced by a microorganism~~, comprising: contacting a covalently reactive ligand analogue (CAL) of formula (1): wherein, L.sub.1 . . . L.sub.x . . . L.sub.m are components defining a ligand determinant, L.sub.x is a component unit of the ligand determinant selected from the group consisting of an amino acid residue, sugar residue, a fatty acid residue and a nucleotide, L' is a functional group of L.sub.x, Y" is atom, covalent bond or linker, Y' is an optional charged or neutral group Y is a covalently reactive electrophilic group that reacts specifically with a receptor that binds to said ligand determinant, and n is an integer from 1 to 1000 m is an integer from 1 to 30; with a nucleophilic receptor produced by a microorganism, that reacts specifically with the ligand determinant of said CAL~~.

Claim 29 (canceled).

Claim 30 (original): The method of claim 28, wherein the microorganism is a pathogen selected from HIV-1 and HCV.

Claim 31 (original): The method of claim 28, wherein the NuR is an antibody.

Claim 32 (original): The method of claim 31, wherein the antibody is an autoantibody, alloantibody or xenoantibody.

Claim 33 (original): The method of claim 31, wherein the antibody is a member of the group consisting of autoantibodies to VIP, Factor VIII Abs, thyroglobulin, prothrombin, nucleic acids, EGFR and fibrillin-1.

Claim 34 (original): The method of claim 31, wherein the antibody is a member of the group consisting of alloantibodies to Factor VIII, red blood cell antigens, platelet antigens, kidney antigens, heart antigens and lung antigens.

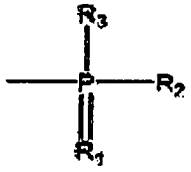
Claims 35-43 (canceled).

Claim 44 (currently amended): A method for preparing self-assembled biomolecules, comprising: subjecting [[a]] the CAL of formula (1) of claim 1 to conditions which promote the formation of self-assembled multiple units, optionally incorporating one or more cofactor in the assembly.

Claim 45 (currently amended): The method of claim 44, wherein L' is ~~selected from~~ a carboxyl group, an amino group, a hydroxyl group, a sulfhydryl group, a 4-hydroxy phenyl group, a phenyl group, an imidazole group, an indole group, a methylthioethyl group, a guanidino group, a linear alkyl group, a branched alkyl group, a cyclic alkyl group, a linear alkenyl group, a branched alkenyl group, a cyclic alkenyl group, a linear alkynyl group, a branched alkynyl group, an cyclic alkynyl group, an aryl group, an amide group, an aldehyde group, a ketone group, a phosphate group, a sulfate group, or a side chain functional group of ~~the following~~ an amino acid residue[[s:]] glycine, alanine, leucine, isoleucine, valine, methionine, cystein, aspartic acid, glutamic acid, asparagine, glutamine, lysine, arginine, phenylalanine, tyrosine, tryptophan, histidine, serine, threonine or proline,

Y'' is a suberoyl group,

Y' is an amino(4-amidinophenyl)methyl group or an amino(phenyl)methyl group,
Y has the formula (2):



(2)

R_1 is an oxygen or sulfur atom, and

R_2 and R_3 are selected from alkoxy group and phenoxy group, ~~and~~

~~m is 4 to 22~~.

Claim 46 (original): The method of claim 44, wherein the biomolecule is an oligomeric gp120-CAL.

Claim 47 (original): The method of claim 46 in which gp41 is used a cofactor to promote the assembly of oligomeric gp120-CAL.

Claim 48 (original): The method of claim 44, further comprising generating antibodies to said biomolecule.

Claims 49-61 (canceled).

Claim 62 (new): The CAL of Claim 1 wherein L_1 and L_m are polypeptides, polysaccharides, lipidic groups or nucleic acid groups and Lx is selected from the group consisting of an amino acid residue, sugar residue, a lipid residue or a nucleotide.

Claim 63 (new): The CAL of claim 62, wherein L_1 and L_m are component polypeptides of the ligand determinant, and L_x is an amino acid.

Claim 64 (new): The CAL of Claim 25, wherein L_1 and L_m are polypeptides, polysaccharides, lipidic groups or nucleic acid groups and Lx is an amino acid residue, a sugar residue, a lipid residue or a nucleotide.

Claim 65 (new): The method of claim 26, wherein L' is the side chain functional group of the amino acid residues glycine, alanine, leucine, isoleucine, valine, methionine, cystein, aspartic acid, glutamic acid, asparagine, glutamine, lysine, arginine, phenylalanine, tyrosine, tryptophan, histidine, serine, threonine or proline.